NACE CODE C20, C28, D35

BIOMASS PRETREATMENT "BIOREFINERY" FOR PRODUCTION OF SECOND-GENERATION BIOFUELS AND GREEN CHEMISTRY INTERMEDIATES

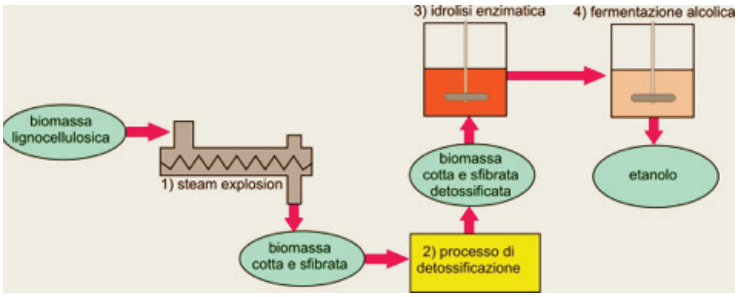
Innovations and benefits - ENEA has patented a method and a facility for pre-treatment and detoxification of lignocellulosic biomass which allows to effectively fractionate it into its main components (cellulose, hemicellulose, lignin, etc.) and then convert it into the desired product. Lignocellulosic biomass can be a very important raw material and energy source, from which a wide range of products –including green fuels, paper pastes, sugars and bioplastics– can be obtained by efficient and eco-friendly conversion processes.

Uses - Production of second-generation bioethanol. Production of chemical intermediates for biorefinery, replacing fossil raw materials with biomaterials. Achievement of 10% biofuel production targets by 2020 and 30% production of bioproducts compared to fossil products. Manufacturing companies possibly interested: chemistry, agrifood, paper, fuel production and marketing.

Past and present activities - Pretreatment is the core of "biorefinery", making the separation of hemicellulose, cellulose and lignin more efficient and less environment-impacting. The process consists in using high-pressure saturated vapor and then detoxification techniques allowing to remove inhibitors and optimize the following bioconversion phases.
On these technologies ENEA holds the following patents:

- *Patent No. RM2012A000184* "Biomass detoxification method"
- *Patent No. RM2009A000290* "Biomass pretreatment process for bioethanol production"
- *Patent No. FI2009A000232* "Biomass pretreatment system"
- *Patent No. RM2003A00446* "Separated-chamber bioreactor for bioethanol production".

The main activities and applications have been related to the development of innovative pretreatment method for producing alcohol from lignocellulose; still now these technologies are used for producing sugary broths precursors of a wide range of green chemistry products (biofuels and biopolymers), in collaboration with large industrial groups such as Novamont, Versalis and Matrica.



RESEARCH TO PROVE FEASIBILITY | TECHNOLOGY DEMONSTRATION | SYSTEM TEST, LAUNCH & OPERATIONS

BASIC TECHNOLOGY RESEARCH | TECHNOLOGY DEVELOPMENT | SYSTEM/SUBSYSTEM DEVELOPMENT

TRL 1 | TRL 2 | TRL 3 | TRL 4 | TRL 5 | TRL 6 | TRL 7 | TRL 8 | TRL 9

TECHNOLOGY READINESS LEVEL

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